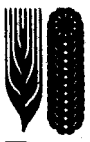
Results of the Third Drought Tolerance Screening Nursery (1984-85)



Results of the Third Drought Tolerance Screening Nursery (1984-85)

Contents

GLOSSARY OF ABBREVIATIONS AND UNITS OF MEASURE
GLOSARIO DE ABREVIATURAS Y UNIDADES DE MEDICION
GLOSSAIRE DES ABRÉVIATIONS ET UNITÉS DE MESURE

Abbreviation	Scientific name	Variable name(scale)	Nombre de la variable (escala)	Nom de la variable (échelle)
AL TOL	–	Aluminum tolerance (0-9 scale)	Tolerancia al aluminio (escala 0-9)	Tolérance à l'aluminium (échelle 0-9)
ALT B	*Alternaria triticina*	Alternaria leaf blight (0-9 scale)	Tizón por alternaria (escala 0-9)	Alternaria (échelle 0-9)
ANT DMGE	–	Ant damage (percentage)	Porcentaje de daño por hormigas	Dégat du aux fourmis en pourcentage
APHD DMGE	–	Aphid damage (percentage)	Porcentaje de daño por áfidos	Dégat du aux pucerons en pourcentage
ARMY WORM	–	Army worm damage (percentage)	Porcentaje de daño por gusano cogollero	Dégat du aux noctuelles en pourcentage
BAC S	*Xanthomonas campestris* pv. translucens	Bacterial leaf streak or stripe (0-9 scale)	Rayado bacteriano y pajilla negra (escala 0-9)	Rayure bactérienne (échelle 0-9)
BAC SP		Bacterial species	Especies bacterianas	Espices bactériennes
BAC B	*Psuedomonas syringae* pv. striafaciens	Bacterial blight (0-9 scale)	Tizón bacteriano de la hoja (escala 0-9)	Brulure bactérienne des feuilles (échelle 0-9)
BAR S	*Pyrenophora graminea* (syn. *Drechslera gramineum*, syn. *Helminthosporium gramineum*)	Barley stripe (0-9 scale)	Mancha estriada de la cebada	Taches brunes de l'orge (*Helminthosporium gramineum*) (échelle 0-9)
BIRD DMGE	–	Bird damage (percentage)	Porcentaje de daño por pájaros	Dégat du aux oiseaux en pourcentage
BW	–	Bread wheat	Trigo	Blé
BYDV	–	Barley yellow dwarf virus (0-9 scale)	Virus del enanismo amarillo de la cebada (escala 0-9)	Jaunisse nanisante de l'orge (échelle 0-9)
CHECK MARK	–	Selected for further investigation	Seleccionada para investigación adicional	Selectionnée pour recherche additionnelle
COVD SMUT	*Ustilago hordei (U. kolleri)*	Covered smut (percentage)	Porcentaje de carbón cubierto	Charbon couvert en pourcentage
EARS/M2	–	Ears per square meter	Espigas por metro cuadrado	Epis par mètre carré
FALL NO	–	Falling number (seconds)	Actividad alfa amilasa (segundos)	Activité de l'alpha amylase (en secondes)
FERT %	–	Fertility (percentage)	Porcentaje de fertilidad	Fertilité en pourcentage
FRST DMGE	–	Frost damage (percentage)	Porcentaje de daño por heladas	Dégat du au gel en pourcentage
FUS N	*Fusarium nivale* (syn. *Monographella nivalis*)	Fusarium leaf blotch (0-9 scale)	Mancha de la hoja y moho níveo (moho blanco) (escala 0-9)	Tache de la feuille (*Fusarium nivale*)(échelle 0-9)
GERM %	–	Germination (percentage)	Porcentaje de germinación	Germination en pourcentage
HAIL DMGE	–	Hail damage (percentage)	Porcentaje de daño por granizo	Dégat du à la grêle en pourcentage
HEAD DAYS	–	Number of days to heading	Número de días al espigamiento	Nombre de jours à l'épiaison
HEL SP	*Helminthosporium* spp.	Helminthosporium (0-9 scale)	Helminthosporium (escala 0-9)	Helminthosporium (échelle 0-9)
L FIRE	–	Leaf fire (0-9 scale)	Tizón foliar (escala 0-9)	Sécheresse des feuilles (échelle 0-9)
LEAF RUST	*Puccinia recondita*	Wheat leaf rust (Cobb scale)	Roya de la hoja-trigo (escala de Cobb)	Rouille brune du blé (échelle de Cobb)
LEAF RUST	*Puccinia hordei*	Barley leaf rust (Cobb scale)	Roya de la hoja-cebada (escala de Cobb)	Rouille brune de l'orge (échelle de Cobb)
LODG %	–	Lodging (percentage)	Porcentaje de acame (vuelco)	Verse en pourcentage
LSE SMUT	*Ustilago nuda (U. tritici)*	Loose smut (percentage)	Porcentaje de carbón volador	Charbon nu en pourcentage
MAT DAYS	–	Number of days to maturity	Número de días a la madurez	Nombre de jours à la maturation
MOIST %	–	Moisture (percentage)	Porcentaje de humedad	Humidité en pourcentage
NECK BRK	–	Neck breakage (percentage)	Porcentaje de rotura de cuello	Cassure du pédoncule en pourcentage
NET B	*Pyrenophora teres* (syn. *Drechslera teres*, syn. *Helminthosporium teres*)	Net blotch (0-9 scale)	Mancha reticulada (escala 0-9)	Helminthosporium de l'orge (échelle 0-9)
NOBS	–	Number of observations	Número de observaciones	Nombre d'observations
OFS	–	Free State Streak	Estriado del estado libre	Rayure Free State
PC	–	Percentage	Porcentaje	Pourcentage
PLNT DENS	–	Plant density (stems/m2)	Densidad de plantas (tallos/m2)	Population de plantes (tiges/m2)
PLNT HT	–	Plant height (cm)	Altura de planta (cm)	Hauteur (cm)
POW M	*Erysiphe graminis*	Powdery mildew (0-9 scale)	Oídio o cenicilla polvorienta (escala 0-9)	Oïdium (échelle 0-9)
PROT %	–	Protein (percentage)	Porcentaje de proteína	Protéine en pourcentage
SCAB %	*Fusarium* spp.	Head scab (percentage)	Porcentaje de roña	Fusarium de l'épi en pourcentage
SCLD	*Rhynchosporium secalis*	Scald (0-9 scale)	Escaldadura (escala 0-9)	Rhyncosporium (échelle 0-9)
SDMT INDX	–	Sedimentation index (cc)	Indice de sedimentación (cc)	Indice de sédimentation (cc)
SEP N	*Leptosphaeria nodorum* (syn. *Septoria nodorum*)	Septoria glume blotch (0-9 scale)	Tizón de la gluma (escala 0-9)	Septoria nodorum (échelle 0-9)
SEP P	*Septoria passerinii sacc.*	Septoria leaf blotch (barley)	Mancha foliar (cebada)	Tache septorienne des feuilles de l'orge
SEP S	*Septoria* spp.	Septoria glume/leaf blotch (0-9 scale)	Septoria (escala 0-9)	Septoria (échelle 0-9)
SEP T	*Mycosphaerella graminicola* (syn. *Septoria tritici*)	Septoria leaf blotch (0-9 scale)	Mancha foliar o tizón foliar (escala 0-9)	Septoria tritici (échelle 0-9)
SHTR %		Shattering, head (percentage)	Porcentaje de desgrane (espiga)	Egrenage en pourcentage
SL		Sea level	Nivel del mar	Niveau de la mer
SPT B	*Cochliobolus sativus* (syn. *Bipolaria sorokiniana*, syn. *Helminthosporium sativum*)	Spot blotch (0-9 scale)	Tizón foliar (escala 0-9)	Tache de la feuille (*Helminthosporium sativum*) (échelle 0-9)
STEM RUST	*Puccinia graminis*	Stem rust (Cobb scale)	Roya del tallo (escala de Cobb)	Rouille noire (échelle de Cobb)
STRP RT.H	*Puccinia striiformis*	Stripe rust, head (percentage)	Porcentaje de roya amarilla (espiga)	Rouille jaune sur épi en pourcentage
STRP RT.L	*Puccinia striiformis*	Stripe rust, leaf (Cobb scale)	Roya amarilla-hoja (escala de Cobb)	Rouille jaune sur feuilles (échelle de Cobb)
STRP V		Barley stripe mosaic virus (scale 0-9)	Virus del mosaico lineal de la cebada (escala 0-9)	Mosaïque striée de l'orge (échelle 0-9)
TAN S	*Pyrenophora tritici-repentis* (syn. *Helminthosporium tritici-repentis*)	Tan spot (0-9 scale)	Mancha foliar amarilla (escala 0-9)	Helminthosporium tritici (échelle 0-9)
Tcl	–	Triticale	Triticale	Triticale
TEST WT	–	Test weight (kg/hl)	Peso hectolítrico (kg/hl)	Poids spécifique (kg/hl)
1000 G.W.	–	1000-grain weight (g)	Peso de 1000 granos (g)	Poids de 1000 grains (g)
VAR	–	Variety	Variedad	Variété
VTY	–	Variety	Variedad	Variété
YELL BERR		Yellow berry (percentage)	Porcentaje de panza blanca	Mitadinage en pourcentage
YIELD KG/HA	–	Yield (kg/ha)	Rendimiento (kg/ha)	Rendement (kg/ha)

Third Drought Tolerance Screening Nursery

Sanjaya Rajaram, Wolfgang Pfeiffer, Ravi Singh, and Maximino Alcala[1]

Introduction

Thirty-seven percent of the Third World is semiarid where moisture is the biggest production constraint. The Middle East/North African region, extending into Turkey, represents 59% of this area. In South and East Asia, the countries with the largest semiarid area are India and China. Argentina ranks first in semiarid area among Latin American countries.

The drought tolerance testing and breeding program at CIMMYT was initiated to provide improved germplasm for these semiarid areas.

Germplasm Development

The CIMMYT approach to drought tolerance breeding is to breed varieties alternately in highly favorable environments, where they can realize their yield potential, and in moisture stress conditions, on the assumption that input efficiency and input responsiveness can be combined. The CIMMYT program for drought tolerance involves two crop cycles per year. There is a summer cycle in Huamantla, Tlaxcala (2,500 masl, 19°N latitude), where genotypes are screened for resistance to drought in rainfed and sandy soil environments. Planting is done in May when daylength is increasing. The winter crop is grown in Cd. Obregon (39 masl, 27.2°N latitude). Cd. Obregon has dry weather from October to May, and the long-term seasonal average rainfall is 48.2 mm. This is a suitable environment for drought trials if the number of irrigation applications is regulated. In an optimum breeding program, five to six irrigations are applied to produce a good crop of wheat. In our drought experiments, plants receive only one or two irrigations to facilitate the selection of lines. The lines chosen are further tested in Huamantla under rainfed conditions. High fertility and optimum moisture are applied in the F_2, F_5, and F_6 generations. The F_3 and F_4 generations are grown under low fertility and reduced moisture or rainfed conditions. Selection during the irrigated and well fertilized F_2, F_5, and F_6 generations is conducted normally. Rust epidemics are created and susceptible plants are discarded. Good tillering capacity, head development, leaf retention capability, and grain plumpness are the characters evaluated in the individual plant and line selections. Advanced lines are simultaneously subjected to yield trials under optimum and stress conditions. Lines that perform well under both conditions are included in the Drought Screening Nursery.

Methodology

The Third Drought Screening Nursery (DSN) was sent to cooperators in September 1984 to be grown in their spring season of 1985. Eighty-seven nurseries were sent to cooperators in 50 countries. The 126 advanced lines and checks were selected from the best material in a manner described above. The seed for this international nursery was multiplied at Cd. Obregon, cleaned, and treated with insecticide and organic fungicide before shipment.

Instructions on nursery management accompanied the mailing of seeds to each cooperator. Enough seed from each line was provided for a double row, unreplicated, of at least 2 m in length. A field book was included with each nursery set, providing a standard format for recording data desired by CIMMYT. In receiving and processing the data returned by cooperators, CIMMYT assumes that the nursery was properly handled and that accurate results were reported. We cannot, however, attest to the rigor with which the trials were grown and results were obtained.

Forty-one of the cooperators receiving the nursery returned field books with performance data at their locations (Table 1) in time to be included in this report. The choice of variables measured and the data returned rests with the individual cooperator. We have included in this summary selected variables reported to us. The number of observations differs from variable to variable. The reader is urged to note the number of observations at the head of each variable column in the summary table (Table 2); this may be an important indicator of the level of credibility that should be inferred. The reader should also bear in mind that the yield reported is from a single plot, essentially grown for observation rather than as a rigorous, replicated yield trial.

Rust scoring—Disease scores for stem, leaf and stripe rust infections recorded in the manner recommended by Dr. W.Q. Loegering (USDA International Spring Wheat Rust Nursery, 1959) are converted to a numeric coefficient of infection (CI) prior to being used in any calculations. Each original reading recorded in this manner consists of severity (percentage of rust infection on the plants) and response (kind of infection) scores. Severity is recorded as percent of infection acording to the modified Cobb scale. If only a trace is visible, T or TR may be reported and is given the value of 1 percent.

Responses may be recorded by using one of the following codes. The numeric values assigned to these codes are shown at the right.

Response	Equivalent numeric value
VR	0.2
R	0.2
MR	0.4
M or X	0.6
MS	0.8
S	1.0
VS	1.0

Severity and response are recorded together, with severity first (for example, 5MR). The equivalent

[1]/Head, bread wheat program; bread wheat breeder; associate scientist; and head, international nurseries

coefficient of infection is calculated by multiplying the numeric equivalents of each part. For example:

Disease score	Coefficient of infection
5MR	5(0.4) = 2.0
TR	1(0.2) = 0.2
TRR	1(0.2) = 0.2
60S	60(1.0) =60.0
0*	(0)(0) = 0.0

* If there is no visible infection on the plant, only a zero is reported.

Reactions may be more variable than can be represented by a single severity and response reading. This variability may be recorded in two ways: 1) A comma or slash indicates plants have segregated into clear-cut classes. The first rating reported is included in the computations. 2) If a range of reactions is recorded, it is denoted by a dash. In these cases the coefficient of infection is the average of the two scores. Examples of these situations are given below:

Disease score	Coefficient of infection
5R,40S	The first rating 5R = 5(0.2) = 1.0 is used in all computations
40M/60S	The first rating 40M = 40(0.6) = 24.0 is used in all computations
15R 5S	[15(0.2) + 5(1.0)]/2 = 4.0

A range may be reported for severity only or reponse only. In each of these cases the average severity or average response is calculated before multiplying the two together. For example:

Disease score	Coefficient of Infection
10-20MS	[(10 + 20)/2](0.8) = 12.0
40MR MS	40[(0.4 + 0.8)/2] = 24.0
5-10MR R	[(5 + 10)/2][(0.4 + 0.2)/2] = 2.25

In most tables only average coefficients of infection (ACI) are reported. However, in some tables the highest rust reading (110) net, be reported as severity/response scores.

Summary of Results

The means for yield, agronomic, and disease resistance characteristics for all entries at all locations are listed in Table 2. In addition, the top-performing entries for yield earliest heading, earliest maturity, most resistant to stem rust, leaf rust, and stripe rust are featured in Tables 3-8.

Agronomic Characters—The mean yields from 26 locations of all entries in the 3rd DSN are listed in Table 2. The yield ranged from 3478 kg/ha for entry 98, MON"S" x SIS"S"-CAN"S", to 1551 kg/ha for entry 21, KLAT-SIS"S". The 20 entries with the best yields (3478 to 2805 kg/ha) are listed in Table 3. These also include four selections of VEE"S", the selections of which have shown good adaptation over the years in varied environments. A number of new advanced lines also had good yield compared to the local checks. Drawing conclusions on the basis of yield data from unreplicated plots, such as those in CIMMYT's wheat screening nurseries, can be misleading. However, it is believed that the large number of locations (26) used to calculate the mean yield lends a degree of validity to the data, making them useful as an indicator of lines which merit further testing in replicated trials.

Although the mean days to heading from 27 locations (Table 2) ranged from 90 days for entry 88, ND-SEL101(2) x PVN"S"/SIS"S" to 105 days for entry 3, 63.189.66.7-HYS"S" x FURY, the majority of the lines headed between 90 and 100 days. The 12 earliest heading lines are listed in Table 4 with their single site observations.

The mean days to maturity from 16 locations (Table 2) ranged from 125 days for entry 32, KEA"S" to 140 days for entry 4, AMD"S"-HN4 x COC. The 38 earliest maturing entries are listed in Table 5 with their single site observation. In general, the entries identified in early heading groups were also among the early maturing lines. However, a member of intermediate maturing entries also matured early. All the entries derived from simple spring wheat x winter wheat crosses (entries 1-30) had tendency for late maturity (Table 2).

Rusts—The mean average coefficients of infection (ACI) for leaf rust, stem rust, and stripe rust for all reporting locations are given in Table 2. Tables 6, 7 and 8 include the entries most resistant to leaf rust, stem rust and stripe rust, respectively.

With respect to stem rust, the ACIs varied from 0.7 for entry 114, BNQ"S"-PVN to 47.0 for entry 85, VEE"S"/KLTO-PAT19 x MD-JUP (Table 2). The 15 entries most resistant to stem rust at four locations, namely, Turkey, Bolivia, Brazil and Peru are listed in Table 6.

With respect to leaf rust, the ACIs varied from 0.1 for entry 71, PAT10-ALD"S" x PAT72300/PVN"S" to 36.0 for entry 26, (SN64-HN4 x REX/EDCH-MEX) SLS"S" (Table 2). The 16 entries most resistant to leaf rust at 11 locations are listed in Table 7 with their response at individual locations.

For stripe rust on leaf the ACIs varied from 0.0 for entry 86, DOVE"S"-TSI to 67.1 for entry 21, KLAT-SIS"S". The 10 entries most resistant to stripe rust at seven locations are listed in Table 8, together with their response at individual locations.

Other diseases—The mean responses of entries to other diseases, namely, fusarium scab, powdery mildew, septoria tritici blotch, septoria nodorum blotch, bacteria and BYDV (barley yellow dwarf virus) are also included in Table 2. These diseases are relatively uncommon in drought environments, however, they could be severe in certain highland rainfed environments.

Table 1. Locations returning reports and the variables included

LOCATIONS	CONTINENT	COUNTRY	AREA	VARIABLES INCLUDED
1	AFRICA	KENYA	RIFT VALLEY-NGORE	3 5 9 50 62
2	AFRICA	LIBYA	TRIPOLI-TAJOURA	3 4 9 50
3	AFRICA	MALAWI	NTCHEU DISTRICT (CENTRAL REG.)	1 4 9
4	AFRICA	NIGERIA	KANO	1 3 4 9
5	ASIA	AFGHANISTAN	KABUL	1 50
6	ASIA	BANGLADESH	JESSORE (1ST. DATE)	1 3 4 7 9 50 68
7	ASIA	BANGLADESH	JESSORE (2nd. DATE)	1 3 4 7 9 50 68
8	ASIA	BHUTAN		1 3 9
9	ASIA	BURMA	YE-U (SAGAIN DIV.)	1 3 4 9 13 50
10	ASIA	CHINA	QINGHAI	1 3 4 5 7 9 50
11	ASIA	NEPAL	LALITPUR	7
12	ASIA	PAKISTAN	NWFP-PIRSABAK	1 3 4 9 50
13	ASIA	PAKISTAN	PUNJAB-BARANI	1
14	ASIA	PAKISTAN	PUNJAB-ISLAMABAD	3 50
15	ASIA	PHILIPPINES	LAGUNA	1 4 9 13
16	ASIA	THAILAND	NAKHON RATCHSIMA	1 9 50
17	EUROPE	GREECE	THESSALONIKI	1 3 4 9 50 61
18	EUROPE	PORTUGAL	ELVAS	1 3 9 50
19	EUROPE	SPAIN	CADIZ	3 9 30
20	EUROPE	SPAIN	LERIDA	1 3
21	EUROPE	SPAIN	MADRID-ENCIN	1 3 4 9 50 61
22	MIDDLE EAST	CYPRUS	LAXIA	1 3 9
23	MIDDLE EAST	IRAN	TEHRAN	1 3 4 9
24	MIDDLE EAST	ISRAEL	BET DAGAN-VOLCANI CTR.	5 7 77
25	MIDDLE EAST	QATAR		1 3 4 9
26	MIDDLE EAST	TURKEY	ADANA-CUKUROVA	1 7 50 62
27	MIDDLE EAST	TURKEY	DIYARBAKIR	3 25
28	MIDDLE EAST	TURKEY	IZMIR-AEGEAN	3 5 7 8 9 50
29	NORTH AMERICA	MEXICO	EL BATAN	3 4 7 9
30	NORTH AMERICA	U.S.A.	ARIZONA	1 9
31	NORTH AMERICA	U.S.A.	CALIFORNIA-DAVIS	77
32	SOUTH AMERICA	ARGENTINA	BUENOS AIRES-CRIADERO BUCK	3 5 7 36 50 74
33	SOUTH AMERICA	ARGENTINA	CORDOBA	50
34	SOUTH AMERICA	BOLIVIA	COCHABAMBA	1 9
35	SOUTH AMERICA	BOLIVIA	SANTA CRUZ-CIAT	3 7 8
36	SOUTH AMERICA	BRAZIL	PARANA-LONDRINA	1 3 7 8 9 50 68
37	SOUTH AMERICA	BRAZIL	PARANA-PALOTINA	1 50
38	SOUTH AMERICA	ECUADOR	QUITO, PICHINCHA	3 5 77
39	SOUTH AMERICA	PERU	AYACUCHO	1 3 4 9
40	SOUTH AMERICA	PERU	CUSCO-TARAY	1 3 4 5 8 9
41	SOUTH AMERICA	URUGUAY	COLONIA-MENAFRA	50

*VARIABLE IDENTIFICATIONS

1	YIELD	KG/HA	3	HEAD	DAYS	4	MAT	DAYS	5	STRP	RT. L	7	LEAF	RUST
8	STEM	RUST	9	PLNT	HT	13	1000	G.W.	25	FRST	DMGE	36	SCAB	%
50	CHECK	MARK	61	POW M	0-9	62	SEP T	0-9	68	SPT B	0-9	74	BAC S	0-9
77	BYDV	0-9												

Table 2. Means of all variables across all locations for each line

VTY NO.	VARIETY OR CROSS AND PEDIGREE	GRAIN	ORIGIN	YIELD KG/HA	HEAD DAYS	MAT DAYS	STRP RT. L	LEAF RUST	STEM RUST	PLNT HT
		NUMBER OF OBSERVATIONS:		(26)	(27)	(16)	(7)	(11)	(4)	(26)
1	MYNA"S" SWM4589-7Y-18M-1Y-0M			2146.6	93.3	134.5	27.0	5.7	12.0	72.0
2	MYNA"S" SWM4589-7Y-18M-1Y-0M-56B-0Y			2419.6	94.0	132.1	29.7	8.3	15.3	72.2
3	63.189.66.7-HYS"S" X FURY SWM6739-16Y-2Y-1Y-1Y-2Y-0Y			2326.3	104.6	134.9	18.7	23.8	24.3	81.0
4	AMD"S"-HN4 X COC SWM6838-35Y-1Y-1Y-2Y-0Y			1945.6	99.3	140.3	10.7	0.5	8.7	68.2
5	RP8709.71-COC SWM6845-9Y-1Y-1Y-1Y-0Y			2319.3	101.7	136.7	4.8	3.7	10.7	71.4
6	CD-PCHU X TES SWM6966-6Y-1Y-2Y-4Y-0Y			2255.2	100.0	137.5	45.3	13.3	2.3	75.6
7	CD-PCHU X TES SWM6966-6Y-1Y-2Y-6Y-0Y			1784.2	100.2	138.1	43.8	13.9	7.3	75.4
8	CD-PCHU X TES SWM6966-6Y-1Y-3Y-1Y-0Y			2712.3	99.5	135.0	46.1	16.7	4.0	77.8
9	CD-PCHU X TES SWM6966-6Y-1Y-4Y-0Y			2491.1	100.1	135.2	48.0	14.3	4.0	77.3
10	CD-PCHU X TES SWM6966-6Y-1Y-4Y-2Y-0Y			2774.4	99.6	135.4	49.0	13.8	4.7	77.5
11	CD-PCHU X TES SWM6966-6Y-1Y-4Y-3Y-0Y			2425.7	99.1	135.6	51.4	12.2	7.3	77.8
12	NS732-PIMA SWM6976-9Y-1Y-2Y-0Y			2351.0	97.8	135.5	27.4	22.7	7.7	75.6
13	NS732-PIMA SWM6976-9Y-1Y-2Y-2Y-0Y			2716.3	97.3	134.9	37.3	21.7	7.3	76.6
14	NS732-PIMA SWM6976-9Y-1Y-2Y-4Y-0Y			2567.4	97.0	134.6	31.5	22.0	6.7	75.5
15	NS732-PIMA SWM6976-9Y-1Y-3Y-1Y-0Y			2317.0	97.5	134.5	35.2	31.3	7.3	74.4
16	NS732-PIMA SWM6976-9Y-1Y-3Y-3Y-0Y			2417.8	97.8	135.3	31.0	18.7	10.7	75.0
17	KLIM X D6301-NAI60/KAL-BB SWM7134-2Y-1Y-1Y-0Y			2008.8	101.9	137.4	33.7	1.6	22.7	83.7
18	KLIM X D6301-NAI60/KAL-BB SWM7134-2Y-2Y-1Y-0Y			1789.9	103.5	138.1	30.3	10.4	22.7	80.0
19	KLIM X D6301-NAI60/KAL-BB SWM7134-2Y-2Y-1Y-1Y-0Y			1961.0	102.4	137.1	36.6	12.4	29.3	80.1
20	LOCAL CHECK			3215.8	95.0	131.3	27.7	17.3	3.3	82.8
21	KLAT-SIS"S" SWM7388-8Y-1Y-2Y-1Y-0Y			1551.3	95.9	132.0	67.1	17.0	22.3	79.0
22	(SN64-HN4 X REX/EDCH-MEX)SLS"S" SWM7703-1Y-3Y-1Y-2Y-0Y			2670.2	98.7	133.6	20.0	30.8	34.0	77.3
23	(SN64-HN4 X REX/EDCH-MEX)SLS"S" SWM7703-1Y-3Y-1Y-3Y-0Y			2323.1	99.7	134.2	18.0	26.5	26.0	79.7
24	(SN64-HN4 X REX/EDCH-MEX)SLS"S" SWM7703-1Y-3Y-1Y-5Y-0Y			2823.2	99.1	134.1	15.7	33.7	25.3	79.9
25	(SN64-HN4 X REX/EDCH-MEX)SLS"S" SWM7703-1Y-3Y-1Y-6Y-0Y			2501.3	100.9	134.4	10.8	29.3	18.7	79.4
26	(SN64-HN4 X REX/EDCH-MEX)SLS"S" SWM7703-1Y-3Y-1Y-8Y-0Y			2897.9	99.4	133.3	16.7	36.0	22.7	80.8
27	(SN64-HN4 X REX/EDCH-MEX)SLS"S" SWM7703-1Y-3Y-1Y-10Y-0Y			2415.9	99.1	134.2	16.7	17.2	22.7	81.6

Table 2. Continued

VTY	1000 G. W.	FRST DMGE	SCAB %	CHECK MARK	POW M 0-9	SEP T 0-9	SPT B 0-9	BAC S 0-9	BYDV 0-9
	(2)	(1)	(1)	(21)	(2)	(2)	(3)	(1)	(3)
1	37.0	60.0	-----	9.5	2.5	3.0	6.0	6.0	5.7
2	38.0	60.0	-----	9.5	2.0	5.0	6.0	-----	6.3
3	31.5	80.0	-----	9.5	0.0	3.0	6.0	-----	5.7
4	29.0	60.0	10.0	0.0	5.0	4.0	6.7	-----	5.7
5	28.0	80.0	-----	9.5	2.0	2.0	6.7	-----	4.3
6	30.0	60.0	-----	14.3	3.5	1.0	4.3	-----	6.0
7	29.0	60.0	-----	4.8	2.0	1.0	4.0	-----	3.0
8	30.0	60.0	-----	33.3	1.0	1.0	5.3	-----	6.0
9	28.0	60.0	20.0	19.0	2.5	1.0	5.7	-----	7.0
10	30.5	80.0	-----	23.8	1.0	1.0	5.0	2.0	6.0
11	30.0	80.0	-----	9.5	2.0	1.0	5.3	6.0	7.0
12	30.5	80.0	-----	4.8	1.0	1.0	6.0	4.0	4.5
13	32.5	60.0	20.0	19.0	4.0	2.5	5.3	4.0	5.0
14	28.5	60.0	-----	14.3	2.0	3.0	4.7	6.0	5.0
15	33.0	60.0	-----	14.3	1.0	1.0	4.7	6.0	4.5
16	32.5	60.0	-----	0.0	0.5	1.0	5.3	6.0	5.0
17	31.5	80.0	-----	9.5	2.5	1.0	3.7	6.0	6.0
18	32.0	80.0	-----	9.5	1.0	1.0	4.7	-----	7.0
19	30.0	80.0	-----	9.5	1.0	1.0	5.0	-----	7.0
20	33.0	50.0	-----	0.0	3.0	1.0	6.7	-----	5.0
21	33.5	60.0	-----	4.8	2.5	1.0	6.0	-----	6.0
22	29.5	80.0	20.0	14.3	4.0	0.5	4.7	-----	6.7
23	30.0	60.0	-----	9.5	2.0	2.0	6.3	-----	5.0
24	28.5	60.0	-----	19.0	2.5	1.5	4.3	-----	4.7
25	30.0	60.0	10.0	14.3	2.0	1.5	6.0	-----	5.0
26	29.0	80.0	20.0	19.0	3.0	2.0	5.0	-----	5.3
27	27.0	80.0	-----	4.8	3.0	5.0	4.7	-----	5.0

Table 2. Continued

VTY NO.	VARIETY OR CROSS AND PEDIGREE	GRAIN	ORIGIN	YIELD KG/HA	HEAD DAYS	MAT DAYS	STRP RT. L	LEAF RUST	STEM RUST	PLNT HT
		NUMBER OF OBSERVATIONS:		(26)	(27)	(16)	(7)	(11)	(4)	(26)
28	TJB842 12919-SIS"S" SWM8026-17Y-1Y-1Y-1Y-0Y			2557.6	95.6	133.2	26.0	6.7	6.0	83.5
29	MVR2-SLS"S" SWM8283-6Y-1Y-2Y-1Y-0Y			2584.5	101.0	134.6	19.8	18.0	10.0	82.3
30	STP-YR X WALD(3)-ERA SWM8443-1Y-1Y-1Y-1Y-0Y			1772.5	97.4	131.5	25.3	17.1	42.0	77.1
31	KEA"S" CM21335-C-9Y-3M-1Y-1Y-1Y-0B			2514.7	92.3	127.4	26.8	6.3	1.3	68.6
32	KEA"S" CM21335-C-9Y-3M-1Y-1Y-1Y-0B-2KE-0Y			2522.2	94.2	125.3	32.4	4.3	11.3	69.5
33	KEA"S" CM21335-C-9Y-3M-1Y-1Y-1Y-0B-6KE-0Y			2434.7	94.3	128.2	31.4	3.0	11.3	67.8
34	TAN"S" CM30697-2M-8Y-7M-0Y			2244.5	91.3	128.6	25.8	17.0	4.0	74.5
35	TAN"S" CM30697-2M-8Y-1M-1Y-1B-0Y			2229.1	91.2	131.4	35.3	8.0	5.7	73.9
36	TAN"S" CM30697-2M-8Y-7M-1Y-1B-0Y			2385.4	90.9	128.5	26.9	9.9	8.0	75.2
37	VEE#8 CM33027-F-12M-1Y-1M-1Y-1M-0Y			2708.6	98.1	136.9	24.5	1.0	4.3	71.0
38	VEE"S" CM33027-F-12M-1Y-12M-1Y-1M-0Y			2726.8	100.4	134.2	24.5	13.4	14.7	80.3
39	VEE#9 CM33027-F-12M-1Y-12M-1Y-2M-0Y			2639.2	97.3	135.3	5.5	0.8	2.0	71.4
40	LOCAL CHECK			2752.4	96.0	131.3	22.6	9.3	8.7	79.7
41	VEE"S" CM33027-F-12M-1Y-1M-1Y-1M-0Y-608-0Y-1PTZ-0Y			2827.8	97.1	131.8	12.2	1.8	7.0	68.7
42	VEE#7 CM33027-F-15M-4Y-4M-3Y-2M-1Y-0M			3040.6	96.9	130.7	17.0	14.3	3.3	80.8
43	VEE"S" CM33027-F-15M-4Y-4M-3Y-2M-1Y-0M			2618.8	97.4	131.7	6.5	5.8	3.3	79.8
44	VEE"S" CM33027-F-15M-500Y-0M-66B-0Y			2729.6	95.5	129.9	0.3	19.3	3.3	74.2
45	VEE"S" CM33027-F-15M-500Y-0M-75B-0Y			2897.5	95.3	130.6	1.3	18.1	6.5	76.5
46	VEE"S" CM33027-F-15M-500Y-0M-76B-0Y			2484.0	95.2	131.0	0.3	13.1	3.3	69.2
47	VEE"S" CM33027-F-15M-500Y-0M-89B-0Y			3006.1	95.9	128.7	25.2	25.4	5.3	75.3
48	VEE"S" CM33027-F-15M-500Y-0M-98B-0Y			2662.9	94.3	129.3	0.0	16.0	2.7	74.5
49	VEE"S" CM33027-F-15M-500Y-0M-115B-0Y			2446.5	94.3	129.2	7.5	15.7	2.7	74.2
50	JUN"S" CM33483-C-7M-1Y-0M-5B-0Y			2267.1	90.4	127.0	36.1	9.9	38.0	75.0
51	JUN"S" CM33483-C-7M-1Y-0M-11B-0Y			2720.6	92.4	129.7	34.8	13.7	34.0	78.5
52	MAYA-NAC CM39424-1Y-1M-4Y-1M-2Y-1M-0Y			2663.5	93.6	129.7	3.6	3.6	20.5	74.8
53	HD2206-HORK"S" CM39808-5M-2Y-4M-1Y-1M-1Y-0B			2781.5	96.7	132.9	4.8	1.6	10.7	83.1
54	JUP-BJY"S" CM39992-12M-1Y-1M-1Y-1M-1Y-0B			2713.9	92.4	128.3	6.0	7.3	4.0	69.3
55	JUP-BJY"S" CM40038-6M-4Y-2M-1Y-2M-1Y-0B			2781.6	94.4	133.1	15.2	1.3	8.7	78.2

VTY	1000 G.W.	FRST DMGE	SCAB %	CHECK MARK	POW M 0-9	SEP T 0-9	SPT S 0-9	SAC S 0-9	SYDV 0-9
	(2)	(1)	(1)	(21)	(2)	(2)	(3)	(1)	(3)
28	36.5	80.0	------	19.0	4.0	6.0	5.7	------	5.5
29	30.5	60.0	30.0	19.0	3.0	7.0	4.7	------	5.7
30	31.0	80.0	------	0.0	3.0	6.0	3.7	------	6.0
31	31.5	80.0	------	14.3	1.0	1.0	5.7	------	6.5
32	30.5	60.0	------	19.0	0.0	1.0	5.0	------	6.0
33	29.5	80.0	------	14.3	0.0	1.0	4.3	------	6.3
34	33.0	80.0	------	9.5	2.0	1.0	4.7	4.0	6.3
35	37.0	80.0	------	19.0	2.0	1.0	4.7	4.0	6.3
36	33.5	80.0	------	4.8	2.0	1.0	5.0	4.0	6.3
37	28.0	80.0	------	19.0	3.0	1.0	5.0	------	6.0
38	27.5	60.0	------	33.3	2.0	1.0	3.7	2.0	7.0
39	29.0	60.0	------	9.5	0.0	1.0	4.0	4.0	6.0
40	30.0	50.0	20.0	4.8	1.5	2.0	5.0	------	5.3
41	26.5	80.0	------	4.8	2.0	1.0	4.3	4.0	7.0
42	33.0	80.0	------	19.0	0.0	2.0	5.3	------	5.0
43	35.0	80.0	------	19.0	0.0	2.0	5.3	------	6.0
44	32.5	80.0	------	4.8	0.0	2.0	5.7	------	6.0
45	32.0	80.0	------	9.5	0.0	4.0	6.3	------	6.7
46	31.5	60.0	------	14.3	0.0	5.0	5.7	------	6.7
47	33.0	60.0	------	9.5	1.0	1.0	5.0	4.0	6.0
48	35.0	80.0	------	19.0	0.0	0.0	5.5	2.0	5.7
49	34.5	60.0	------	14.3	0.0	4.0	5.0	------	5.3
50	37.0	60.0	------	28.6	1.0	4.0	6.0	------	7.3
51	34.0	60.0	20.0	42.9	0.0	1.0	5.7	------	6.7
52	33.5	60.0	20.0	19.0	1.0	4.0	5.3	------	4.3
53	26.0	80.0	------	28.6	3.0	2.0	5.0	------	5.3
54	29.0	60.0	------	14.3	3.5	4.0	4.7	------	5.7
55	30.0	80.0	------	23.8	3.5	3.0	5.3	------	6.0

Table 2. Continued

VTY NO.	VARIETY OR CROSS AND PEDIGREE	GRAIN	ORIGIN	YIELD KG/HA	HEAD DAYS	MAT DAYS	STRP RT. L	LEAF RUST	STEM RUST	PLNT HT
	NUMBER OF OBSERVATIONS:			(26)	(27)	(16)	(7)	(11)	(4)	(26)
56	TRT"S" CM40610-25Y-4M-1Y-1M-1Y-0B			2151.2	96.7	132.2	13.0	11.1	8.0	77.2
57	TRT"S" CM40610-25Y-3M-3Y-1M-2Y-0B			2479.9	95.2	130.9	10.8	10.3	5.3	77.3
58	CMT-COC X PLO CM43473-J-1Y-1M-3Y-3M-0Y			2601.9	95.6	129.3	6.8	4.8	2.0	73.7
59	FCT"S" CM43598-II-8Y-1M-5Y-2M-2Y-0B			1804.3	90.9	129.3	24.2	0.3	21.7	68.9
60	LOCAL CHECK			3125.3	95.3	130.2	29.7	11.4	3.3	83.1
61	LIRA"S" CM43903-H-2Y-1M-5Y-1M-1Y-1M-0Y			1643.8	94.9	131.0	2.0	2.3	2.0	67.2
62	LIRA"S" CM43903-H-4Y-1M-1Y-3M-2Y-0B			2073.3	94.0	131.1	18.8	6.5	1.3	64.4
63	LIRA"S" CM43903-H-4Y-1M-1Y-3M-3Y-0B			2580.4	93.6	130.6	19.4	5.4	2.0	63.5
64	LIRA"S" CM43903-H-4Y-1M-4Y-0M			1925.9	91.8	130.1	7.0	5.2	3.3	64.7
65	MAYA-MON"S" X KVZ-TRM CM44083-H-2Y-2M-1Y-1M-1Y-1M-0Y			2549.0	95.7	128.9	3.2	6.6	9.5	81.0
66	BB-ON X CNO"S"-NO/PVN"S" CM46718-28M-1Y-1M-3Y-0M			2538.6	96.3	131.6	22.7	7.9	12.0	78.2
67	PVN"S"-MN70121 CM49893-2M-2Y-1Y-1M-1Y-0M			2276.6	96.1	132.1	50.0	12.6	6.0	76.1
68	PVN"S"-MN70121 CM49893-2M-2Y-1Y-1M-1Y-1M-0Y			2581.1	96.3	132.1	39.8	19.3	9.3	75.8
69	ALD"S"-PVN"S" CM49901-14Y-2Y-6M-4Y-2M-0Y			2432.7	97.2	132.6	33.6	19.8	13.0	79.5
70	4777(2) X FKN-8B/PVN"S" CM49912-37M-1Y-1Y-1M-2Y-0M			2441.7	99.0	134.2	8.0	5.7	35.3	78.5
71	PAT10-ALD"S" X PAT72300/PVN"S" CM49922-1M-2Y-1Y-1M-1Y-0M			2368.3	102.4	134.4	22.0	0.1	4.0	74.8
72	PAT10-ALD"S" X PAT72300/PVN"S" CM49922-1M-2Y-1Y-1M-3Y-0M			2452.0	102.4	135.4	25.0	0.3	10.0	76.7
73	BJY"S"-PRT CM50323-12Y-1M-1Y-0Y			2528.9	93.6	128.3	1.6	8.7	10.7	71.8
74	BUC"S"-BUL"S" CM50609-3Y-1M-3Y-0Y			2214.5	93.5	132.1	17.5	5.4	22.5	79.8
75	PVN"S"-BJY"S" CM52326-1M-1Y-1Y-2M-0Y			2572.8	90.9	126.6	12.6	14.5	32.5	75.2
76	BUC"S"-PVN"S" CM52359-12M-2Y-2B-2Y-1M-0Y			2438.2	96.2	132.5	3.0	5.0	6.0	76.4
77	BUC"S"-CHRC"S" CM52421-26Y-3Y-3M-1Y-1M-0Y			2583.1	95.4	130.9	2.5	3.6	4.7	78.2
78	BJY"S"-COC CM55651-4Y-2Y-1M-4Y-0M			2478.8	97.6	132.8	23.3	4.2	12.0	78.3
79	BJY"S"-COC CM55651-4Y-2Y-1M-4Y-0M			2327.4	97.5	132.6	17.3	2.4	12.7	79.5
80	LOCAL CHECK			2619.2	94.3	130.3	14.8	17.4	3.3	83.1
81	SLS"S"-BUC"S" CM56337-1Y-1Y-1M-1Y-1M-0Y			2234.3	96.1	132.4	45.3	9.3	14.0	74.8
82	BUC"S"(TZPP X IRN46-CN067/PRT) CM56744-7Y-2Y-1M-1Y-0M			2675.7	92.8	131.2	31.0	10.0	28.5	78.6
83	BUC"S"-DCK"S" CM58769-8Y-1M-2Y-1M-0Y			2758.9	96.3	135.0	20.2	20.9	15.7	80.5
84	BUC"S"-DCK"S" CM58769-8Y-1M-3Y-1M-2Y-0M			3071.0	94.2	130.1	40.0	13.7	13.3	75.7

VTY	1000 G. W.	FRST DMGE	SCAB %	CHECK MARK	PDW M 0-9	SEP T 0-9	SPT B 0-9	BAC S 0-9	BYDV 0-9
	(2)	(1)	(1)	(21)	(2)	(2)	(3)	(1)	(3)
56	34.0	80.0	-----	14.3	0.0	3.5	6.0	-----	6.5
57	36.5	80.0	20.0	23.8	1.0	4.0	6.0	-----	5.7
58	31.5	60.0	-----	14.3	0.0	2.0	5.0	-----	6.7
59	38.0	60.0	-----	9.5	2.0	6.0	6.3	-----	5.5
60	34.0	50.0	20.0	4.8	2.0	-----	5.3	-----	5.3
61	28.0	60.0	-----	4.8	0.0	7.0	4.3	-----	5.3
62	30.5	60.0	-----	4.8	0.0	1.0	5.0	-----	5.0
63	33.0	60.0	-----	9.5	0.0	7.5	6.3	-----	5.0
64	32.0	80.0	-----	4.8	2.0	7.0	4.7	-----	4.7
65	43.5	80.0	30.0	33.3	2.0	4.5	5.0	-----	6.0
66	29.5	60.0	-----	23.8	0.0	6.5	5.7	4.0	7.5
67	31.0	60.0	-----	9.5	2.0	1.0	5.3	4.0	7.0
68	30.0	80.0	-----	19.0	2.0	1.0	4.7	4.0	7.0
69	32.0	60.0	-----	28.6	0.0	1.0	4.7	-----	6.0
70	28.5	80.0	-----	9.5	3.0	4.0	5.7	-----	6.0
71	31.0	60.0	40.0	14.3	2.0	1.0	5.0	-----	6.3
72	28.5	80.0	40.0	9.5	0.0	1.0	4.7	-----	6.0
73	31.5	80.0	-----	0.0	4.0	3.0	4.7	-----	7.0
74	35.0	60.0	-----	4.8	2.0	4.0	6.0	-----	5.7
75	36.0	80.0	-----	14.3	2.0	2.0	4.3	-----	6.3
76	30.0	80.0	-----	23.8	3.0	3.0	6.0	-----	7.7
77	35.5	80.0	-----	23.8	2.0	2.0	6.0	-----	7.3
78	29.0	80.0	40.0	0.0	2.0	4.0	6.0	-----	6.5
79	28.0	80.0	40.0	0.0	2.0	4.0	6.3	-----	5.0
80	33.0	50.0	-----	0.0	3.0	4.0	6.0	-----	5.7
81	30.5	60.0	-----	9.5	2.0	1.0	5.7	-----	6.5
82	36.0	80.0	20.0	23.8	3.0	2.0	5.7	-----	6.0
83	38.0	60.0	-----	19.0	3.0	5.0	6.0	-----	6.0
84	34.5	60.0	-----	23.8	3.5	3.0	5.0	-----	7.0

Table 2. Continued

VTY NO.	VARIETY OR CROSS AND PEDIGREE	GRAIN	ORIGIN	YIELD KG/HA	HEAD DAYS	MAT DAYS	STRP RT. L	LEAF RUST	STEM RUST	PLNT HT
	NUMBER OF OBSERVATIONS:			(26)	(27)	(16)	(7)	(11)	(4)	(26)
85	VEE"S"/KLTO-PAT19 X MO-JUP CM58824-1Y-1M-1Y-0M			2678.2	92.9	128.0	24.0	5.9	47.0	73.8
86	DOVE"S"-TSI CM58952-3Y-1M-1Y-2M-0Y			3065.8	95.9	130.1	0.0	0.3	3.3	79.3
87	KEA"S"-TOW"S" CM58975-2Y-3M-1Y-7M-2Y-0M			2943.6	94.3	128.1	0.8	4.2	14.5	75.1
88	ND-SEL101(2) X PVN"S"/SIS"S" CM59710-2Y-1M-1Y-2M-3Y-0M			2517.4	90.0	127.2	8.8	4.9	39.5	75.6
89	F6.74-SUN"S" X SIS"S" CM60042-M-1Y-2M-2Y-1M-2Y-0M			2613.3	97.7	134.8	34.2	6.2	39.0	82.7
90	F60314.76-ALDAN"S" X TTM"S" CM60044-E-2Y-2M-2Y-0M			2505.5	94.6	131.8	18.8	5.2	18.0	70.2
91	LOV23-BJY"S"/BB-NOR X CNO"S"-7C CM60338-H-1Y-1M-3Y-3M-0Y			2191.6	100.7	137.2	34.0	10.2	10.0	77.6
92	PVN-DOVE"S" CM61816-5Y-1M-4Y-1M-0Y			2339.6	95.0	134.9	34.9	16.5	2.7	77.5
93	PVN"S"-PAM"S" CM61832-1Y-2M-4Y-1M-0Y			2668.0	99.9	136.2	17.8	22.5	5.3	82.1
94	MON"S"-IMU CM61942-4Y-2M-2Y-2M-2Y-0M			2704.4	92.7	127.6	4.2	20.3	4.0	81.2
95	MRL"S"-BUC"S" CM61949-12Y-6M-2Y-3M-0Y			2461.3	94.1	130.5	6.8	14.0	4.0	80.9
96	MRL"S"-BUC"S" CM61949-15Y-1M-1Y-1M-3Y-0M			2586.0	96.5	130.7	4.0	5.6	3.0	82.3
97	MON"S" X SIS"S"-CAN"S" CM62142-5Y-3M-1Y-2M-1Y-0M			3091.5	92.3	130.4	7.5	0.8	8.7	75.7
98	MON"S" X SIS"S"-CAN"S" CM62142-5Y-3M-1Y-2M-4Y-0M			3478.3	91.0	131.6	8.2	8.2	9.3	77.7
99	(BB X TOB-CNO67/HUAC"S")TI REBEL/BB-PL X BX CM62287-5M-1Y-1M-1Y-0M			2567.1	92.9	130.9	33.7	5.5	11.3	73.5
100	LOCAL CHECK			2907.0	94.7	131.1	35.7	13.0	8.7	81.3
101	NAC-VEE"S" CM64224-5Y-1M-1Y-0M			2525.3	91.3	129.6	29.8	17.1	6.0	80.0
102	TAN"S"/TI-TOB X ALD"S" CM64340-4M-1Y-1M-2Y-0M			2586.5	93.2	129.2	25.5	1.5	4.0	75.2
103	TAN"S"/TI-TOB X ALD"S" CM64340-4M-1Y-1M-3Y-0M			2353.3	93.2	128.9	22.8	5.7	2.0	74.3
104	SPRW"S"-PVN"S" X VEE"S" CM64491-6Y-1M-1Y-0M			2517.4	95.9	129.8	18.8	9.3	1.3	71.9
105	SPRW"S"-PVN"S" X VEE"S" CM64491-6Y-1M-5Y-0M			2599.5	95.2	127.6	18.8	4.3	2.0	71.4
106	MYNA"S"-VUL"S" CM64546-2M-1Y-1M-5Y-0M			2525.3	96.4	131.3	1.0	3.6	2.0	75.2
107	R37-GHL121 X KAL-BB/KLT"S" CM64609-5Y-4M-4Y-0M			2816.9	93.5	133.1	22.0	6.0	6.7	70.4
108	R37-GHL121 X KAL-BB/KLT"S" CM64609-6Y-3M-1Y-0M			2874.3	93.0	129.7	20.3	5.0	4.0	70.0
109	R37-GHL121 X KAL-BB/KLT"S" CM64609-6Y-1M-2Y-0M			2728.0	92.9	129.3	16.8	8.0	5.3	70.1
110	R37-GHL121 X KAL-BB/KLT"S" CM64609-6Y-3M-2Y-0M			2775.5	92.5	128.9	10.4	1.7	2.7	69.8
111	KEA"S"(KAL-BB X CJ"S"/ALD"S") CM64617-9M-1Y-1M-3Y-0M			2336.0	91.4	126.9	30.2	3.0	14.3	70.3
112	PRL"S"-VEE"S" CM64624-2Y-1M-4Y-0M			2354.4	92.5	128.4	0.0	1.7	1.3	65.7
113	BNQ"S"-PVN CM64653-8Y-3M-1Y-0M			2813.9	93.2	129.3	36.4	14.0	1.3	72.3

VTY	1000 G.W	FRST DMGE	SCAB %	CHECK MARK	POW M 0-9	SEP T 0-9	SPT B 0-9	BAC S 0-9	BYDV 0-9
	(2)	(1)	(1)	(21)	(2)	(2)	(3)	(1)	(3)
85	36.5	60.0	-----	9.5	2.0	3.0	5.0	-----	7.0
86	33.0	60.0	10.0	42.9	0.0	5.0	6.0	-----	5.7
87	33.0	60.0	40.0	23.8	1.5	5.0	5.7	-----	7.3
88	39.0	60.0	-----	14.3	3.0	4.0	5.0	-----	5.5
89	33.0	60.0	-----	14.3	2.0	1.0	4.7	-----	6.7
90	27.0	60.0	-----	9.5	3.0	4.0	5.0	-----	5.0
91	30.5	60.0	-----	14.3	2.0	1.0	6.0	-----	5.3
92	30.0	60.0	-----	9.5	3.0	1.0	5.0	-----	6.0
93	30.0	60.0	-----	4.8	2.0	4.0	6.3	-----	6.0
94	39.0	60.0	30.0	33.3	2.0	4.5	6.3	-----	5.3
95	31.5	60.0	-----	19.0	2.0	4.0	5.7	-----	6.0
96	31.5	60.0	-----	14.3	1.0	6.5	6.0	-----	7.0
97	29.0	60.0	-----	19.0	3.0	5.5	5.3	-----	7.5
98	32.0	60.0	-----	33.3	3.0	6.0	4.0	-----	7.5
99	31.5	80.0	-----	28.6	2.0	1.0	5.7	-----	7.5
100	32.0	60.0	30.0	0.0	3.5	1.0	5.7	-----	5.0
101	37.0	60.0	-----	4.8	2.0	4.5	4.7	-----	6.5
102	35.5	60.0	-----	28.6	3.0	1.0	5.3	-----	6.3
103	38.0	60.0	-----	9.5	3.0	1.0	5.0	-----	5.7
104	32.0	80.0	-----	0.0	2.0	1.0	5.0	-----	5.7
105	28.5	80.0	-----	9.5	2.5	1.0	5.0	-----	5.0
106	38.0	80.0	-----	28.6	0.0	2.0	5.0	-----	5.0
107	32.0	80.0	-----	0.0	3.0	2.0	5.0	-----	5.7
108	31.5	80.0	-----	9.5	3.0	2.0	5.3	-----	5.0
109	31.0	80.0	-----	4.8	4.0	4.0	5.0	-----	5.7
110	32.0	80.0	-----	14.3	4.0	2.0	4.7	-----	6.3
111	35.5	60.0	-----	9.5	2.0	1.0	4.3	-----	6.7
112	33.0	80.0	-----	9.5	1.0	6.0	5.0	-----	6.7
113	33.5	80.0	-----	19.0	4.5	1.0	4.3	-----	7.0

Table 2. Continued

VTY NO.	VARIETY OR CROSS AND PEDIGREE	GRAIN	ORIGIN	YIELD KG/HA	HEAD DAYS	MAT DAYS	STRP RT. L	LEAF RUST	STEM RUST	PLNT HT
	NUMBER OF OBSERVATIONS:			(26)	(27)	(16)	(7)	(11)	(4)	(26)
114	BNG"S"-PVN CM64653-8Y-3M-2Y-0M			2805.8	95.4	130.0	21.8	7.2	0.7	72.7
115	BNG"S"-PVN CM64653-8Y-3M-6Y-0M			2729.5	94.6	130.1	34.3	12.7	2.3	72.7
116	BNG"S"-PVN CM64653-8Y-4M-1Y-0M			2778.3	96.4	131.3	36.4	17.0	2.0	75.0
117	MOR"S"-MON"S" CM64736-6Y-2M-3Y-0M			2570.2	96.8	131.6	16.2	17.0	4.0	70.9
118	MOR8-MON"S" CM64736-9Y-2M-1Y-0M			2648.7	92.4	129.6	14.7	2.3	11.3	76.3
119	(RRV-MM15/BJ"S"-ON(2) X BON)NAC CM65202-3M-2Y-1M-1Y-0M			2538.8	92.0	127.9	17.0	20.1	9.3	74.2
120	LOCAL CHECK			2823.3	94.8	129.7	28.2	14.7	9.3	81.8
121	(RRV-MM15/BJ"S"-ON(2) X BON)NAC CM65202-3M-2Y-3M-3Y-0M			2998.5	91.0	131.9	26.0	19.5	4.0	76.0
122	JCAM-EMU"S" X CHRC"S"((IA820 X WTE(3) -NAR/KVK"S") CM66246-C-1M-1Y-1M-2Y-0M			2384.8	92.8	131.0	21.6	0.8	5.7	66.2
123	(4777(2) X FKN-GB/VEE"S")BUC"S"-PVN" " CM66684-B-1M-6Y-3M-3Y-0M			2729.2	96.0	131.4	7.2	6.1	1.5	73.8
124	(SN64-882 X ALD"S"/TI REBEL-COC)IA85 /IA820 X WTE(3)-NAR CM67208-B-3M-2Y-2M-1Y-0M			2478.2	94.2	133.5	39.6	24.7	34.7	74.9
125	(SN64-882 X ALD"S"/TI REBEL-COC)IA85 /IA820 X WTE(3)-NAR CM67208-B-3M-2Y-2M-2Y-0M			2344.9	93.5	130.3	39.6	16.5	31.0	73.8
126	KEA"S"-BUC"S" CM67354-14Y-2M-3Y-0M			2731.0	92.7	129.8	28.0	12.0	28.5	69.0

VTY	1000 G. W.	FRST DMGE	SCAB %	CHECK MARK	POW M 0-9	SEP T 0-9	SPT B 0-9	BAC S 0-9	BYDV 0-9
	(2)	(1)	(1)	(21)	(2)	(2)	(3)	(1)	(3)
114	33.0	60.0	-----	23.8	1.0	1.0	5.7	-----	7.3
115	30.5	60.0	-----	19.0	2.0	1.0	5.3	-----	7.5
116	32.0	60.0	-----	23.8	2.0	1.0	6.3	-----	6.7
117	32.5	80.0	10.0	9.5	3.0	1.0	5.0	-----	6.7
118	29.5	60.0	-----	23.8	2.0	1.0	4.7	-----	6.7
119	34.0	60.0	-----	9.5	3.0	3.0	5.0	-----	4.3
120	32.5	50.0	-----	0.0	2.0	1.0	5.3	-----	5.5
121	34.5	60.0	-----	4.8	0.0	4.5	5.3	-----	4.5
122	28.5	60.0	-----	9.5	1.0	1.0	5.7	-----	5.3
123	37.0	60.0	-----	33.3	0.0	5.0	6.0	-----	6.0
124	32.0	60.0	-----	9.5	3.0	3.0	6.0	-----	5.5
125	32.0	60.0	-----	4.8	4.0	1.0	6.7	-----	7.0
126	32.0	-----	-----	19.0	2.0	1.0	5.7	-----	7.5

Table 3. Top performing lines: yield

LOCATIONS	CONTINENT	COUNTRY	AREA	VARIABLES INCLUDED
3	AFRICA	MALAWI	NTCHEU DISTRICT (CENTRAL REG.)	1
4	AFRICA	NIGERIA	KANO	1
5	ASIA	AFGHANISTAN	KABUL	1
6	ASIA	BANGLADESH	JESSORE (1ST. DATE)	1
7	ASIA	BANGLADESH	JESSORE (2nd. DATE)	1
8	ASIA	BHUTAN		1
9	ASIA	BURMA	YE-U (SAGAIN DIV.)	1
10	ASIA	CHINA	QINGHAI	1
12	ASIA	PAKISTAN	NWFP-PIRSABAK	1
13	ASIA	PAKISTAN	PUNJAB-BARANI	1
15	ASIA	PHILIPPINES	LAGUNA	1
16	ASIA	THAILAND	NAKHON RATCHSIMA	1
17	EUROPE	GREECE	THESSALONIKI	1
18	EUROPE	PORTUGAL	ELVAS	1
20	EUROPE	SPAIN	LERIDA	1
21	EUROPE	SPAIN	MADRID-ENCIN	1
22	MIDDLE EAST	CYPRUS	LAXIA	1
23	MIDDLE EAST	IRAN	TEHRAN	1
25	MIDDLE EAST	QATAR		1
26	MIDDLE EAST	TURKEY	ADANA-CUKUROVA	1
30	NORTH AMERICA	U. S. A.	ARIZONA	1
34	SOUTH AMERICA	BOLIVIA	COCHABAMBA	1
36	SOUTH AMERICA	BRAZIL	PARANA-LONDRINA	1
37	SOUTH AMERICA	BRAZIL	PARANA-PALOTINA	1
39	SOUTH AMERICA	PERU	AYACUCHO	1
40	SOUTH AMERICA	PERU	CUSCO-TARAY	1

*VARIABLE IDENTIFICATIONS
1 YIELD KG/HA

Table 3. Continued

VTY NO	VARIETY OR CROSS AND PEDIGREE	LOCATIONS 3	4	5	6	7	8	9	10	12	13	15	16	17	18
98	MON"S" X SIS"S"-CAN"S" CM62142-5Y-3M-1Y-2M-4Y-0M	2933	1244	---	1559	1539	1742	1274	5708	2720	2866	---	853	1353	3000
20	LOCAL CHECK	3466	1600	---	1479	1446	9770	2196	5383	3560	799	1800	359	2161	---
60	LOCAL CHECK	4666	2667	---	1426	1459	---	3176	6416	2480	2733	1600	546	1992	---
97	MON"S" X SIS"S"-CAN"S" CM62142-5Y-3M-1Y-2M-1Y-0M	2400	2667	---	1533	1526	1457	1235	6083	2880	4066	730	626	1453	---
84	BUC"S"-DCK"S" CM58769-8Y-1M-3Y-1M-2Y-0M	4066	1956	---	2599	2533	1614	1921	5875	3520	2266	1100	613	1215	---
86	DOVE"S"-TSI CM58952-3Y-1M-1Y-2M-0Y	3333	4622	---	1386	1373	1909	1516	5708	2560	2399	1400	679	1938	4260
42	VEE#7 CM33027-F-15M-4Y-4M-3Y-2M-1Y-0M	3333	2000	---	1219	1186	---	1450	3833	2800	2266	1100	293	999	---
47	VEE"S" CM33027-F-15M-500Y-0M-89B-0Y	3200	3911	---	1039	999	---	1810	6250	2080	2133	1030	359	1615	---
121	(RRV-WW15/BJ"S"-ON(2) X BON)NAC CM65202-3M-2Y-3M-3Y-0M	4000	4444	---	473	433	1233	797	5791	2920	1999	---	639	969	---
87	KEA"S"-TOM"S" CM58975-2Y-3M-1Y-7M-2Y-0M	2933	2667	---	1493	1533	1792	1490	5875	2080	2666	1100	119	3007	---
100	LOCAL CHECK	3733	3956	---	1279	1673	983	2235	5250	2800	2933	1100	333	2622	---
26	(SN64-HN4 X REX/EDCH-MEX)SL8"S" SWM7703-1Y-3Y-1Y-8Y-0Y	3266	4444	1750	1433	1459	1050	1666	5333	2240	2933	780	213	1476	5680
45	VEE"S" CM33027-F-15M-500Y-0M-75B-0Y	3066	1778	---	886	853	---	1738	5916	1200	1266	890	533	1730	3420
108	R37-GHL121 X KAL-BB/KLT"S" CM64609-6Y-3M-1Y-0M	3400	4444	---	1486	1473	1392	1352	8083	2160	2399	1300	279	1884	---
41	VEE"S" CM33027-F-12M-1Y-1M-1Y-1M-0Y-60B-0Y-1PTZ-0Y	3000	3556	---	1173	1146	1143	954	3458	2640	2599	410	426	1599	---
120	LOCAL CHECK	4000	3733	---	1433	753	---	1686	5000	4000	1999	1400	533	1723	---
24	(SN64-HN4 X REX/EDCH-MEX)SL8"S" SWM7703-1Y-3Y-1Y-5Y-0Y	3233	3378	---	1559	1546	1045	1575	6875	2640	1999	620	346	1738	---
107	R37-GHL121 X KAL-BB/KLT"S" CM64609-5Y-4M-4Y-0M	3333	2667	---	1299	1293	1402	1882	5916	3200	2133	---	439	953	---
113	BNG"S"-PVN CM64653-8Y-3M-1Y-0M	4000	1778	---	1513	1479	1256	1052	5500	2000	1999	1400	519	1553	3013
114	BNG"S"-PVN CM64653-8Y-3M-2Y-0M	2933	2667	---	1133	1106	---	1300	6625	3280	2133	1010	733	1438	5000

Table 3. Continued

VTY NO.	VARIETY OR CROSS AND PEDIGREE	LOCATIONS 20	21	22	23	25	26	30	34	36	37	39	40	MEAN
98	MON"S" X SIS"S"-CAN"S" CM62142-9Y-3M-1Y-2M-4Y-0M	7500	4427	3099	2533	3500	11250	3159	3966	3440	---	3526	6809	3478.3
20	LOCAL CHECK	---	5013	2958	5200	5900	---	2223	1633	---	5778	2846	1761	3215.8
60	LOCAL CHECK	---	5707	2083	5866	4100	---	2867	2716	---	5556	2593	1857	3125.3
97	MON"S" X SIS"S"-CAN"S" CM62142-9Y-3M-1Y-2M-1Y-0M	6750	4693	2433	2233	3700	8500	1755	4200	---	---	3046	4047	3091.5
84	BUC"S"-DCK"S" CM58769-8Y-1M-3Y-1M-2Y-0M	3000	5280	1249	4333	5000	6750	2204	3500	---	---	3206	3761	3071.0
86	DOVE"S"-TSI CM58952-3Y-1M-1Y-2M-0Y	2500	6027	2291	3866	4800	7250	1638	3116	2940	---	2306	3761	3065.8
42	VEE87 CM33027-F-15M-4Y-4M-3Y-2M-1Y-0M	7000	5067	3208	2866	4900	5500	3081	3900	3050	6000	2693	2190	3040.6
47	VEE"S" CM33027-F-15M-5OOY-0M-898-0Y	3250	5440	1958	1933	3400	---	2457	8866	---	5407	2040	3952	3006.1
121	(BRV-4N15/BJ"S"-ON(2) X BON)NAC CM65202-3M-2Y-3M-3Y-0M	1250	3840	2633	4000	3000	10750	2145	4583	---	---	2260	4809	2998.5
87	KEA"S"-TOM"S" CM58973-2Y-3M-1Y-7M-2Y-0M	6250	4693	2066	4866	2300	7250	858	3450	---	---	2320	3952	2943.6
100	LOCAL CHECK	---	3627	3416	5466	4300	---	2555	2816	---	2519	3280	4571	2907.0
26	(BN64-HN4 X REX/EDCH-MEX)BLS"S" BMM7703-1Y-3Y-1Y-8Y-0Y	3500	4800	2608	3400	6000	8000	3003	1833	---	---	826	1857	2897.9
45	VEE"S" CM33027-F-15M-5OOY-0M-758-0Y	5250	5227	2941	3266	4200	---	3491	4333	---	5481	3186	3095	2897.5
108	R37-GHL121 X KAL-BB/KLT"S" CM64609-6Y-3M-1Y-0M	5000	5227	2958	2000	3000	---	1677	3083	3250	---	2626	4762	2874.3
41	VEE"S" CM33027-F-12M-1Y-1M-1Y-1M-0Y-60B-0Y-1PTZ-0Y	9750	5173	2708	3800	4000	---	2360	2333	---	---	3346	3809	2827.8
120	LOCAL CHECK	---	3733	2166	4000	4000	---	2789	5333	---	---	2220	3142	2823.3
24	(BN64-HN4 X REX/EDCH-MEX)BLS"S" BMM7703-1Y-3Y-1Y-8Y-0Y	4750	4000	2999	3733	4300	8250	1872	2066	---	---	1206	2381	2823.2
107	R37-GHL121 X KAL-BB/KLT"S" CM64609-5Y-4M-4Y-0M	5500	4320	2224	4400	2300	---	2574	3750	---	---	1706	5047	2816.9
113	BNB"S"-PVN CM64653-8Y-3M-1Y-0M	3000	3787	2508	4400	4700	---	1775	4166	---	5407	2486	5428	2813.9
114	BNB"S"-PVN CM64653-8Y-3M-2Y-0M	3500	4640	2208	2466	3300	---	1892	3866	---	5111	1673	3714	2805.8

Table 4. Top performing lines: earliest heading

LOCATIONS	CONTINENT	COUNTRY	AREA	VARIABLES INCLUDED
1	AFRICA	KENYA	RIFT VALLEY-NGORE	3
2	AFRICA	LIBYA	TRIPOLI-TAJOURA	3
4	AFRICA	NIGERIA	KANO	3
6	ASIA	BANGLADESH	JESSORE (1ST. DATE)	3
7	ASIA	BANGLADESH	JESSORE (2nd. DATE)	3
8	ASIA	BHUTAN		3
9	ASIA	BURMA	YE-U (SAGAIN DIV.)	3
10	ASIA	CHINA	QINGHAI	3
12	ASIA	PAKISTAN	NWFP-PIRSABAK	3
14	ASIA	PAKISTAN	PUNJAB-ISLAMABAD	3
17	EUROPE	GREECE	THESSALONIKI	3
18	EUROPE	PORTUGAL	ELVAS	3
19	EUROPE	SPAIN	CADIZ	3
20	EUROPE	SPAIN	LERIDA	3
21	EUROPE	SPAIN	MADRID-ENCIN	3
22	MIDDLE EAST	CYPRUS	LAXIA	3
23	MIDDLE EAST	IRAN	TEHRAN	3
25	MIDDLE EAST	QATAR		3
27	MIDDLE EAST	TURKEY	DIYARBAKIR	3
28	MIDDLE EAST	TURKEY	IZMIR-AEGEAN	3
29	NORTH AMERICA	MEXICO	EL BATAN	3
32	SOUTH AMERICA	ARGENTINA	BUENOS AIRES-CRIADERO BUCK	3
35	SOUTH AMERICA	BOLIVIA	SANTA CRUZ-CIAT	3
36	SOUTH AMERICA	BRAZIL	PARANA-LONDRINA	3
38	SOUTH AMERICA	ECUADOR	QUITO, PICHINCHA	3
39	SOUTH AMERICA	PERU	AYACUCHO	3
40	SOUTH AMERICA	PERU	CUSCO-TARAY	3

*VARIABLE IDENTIFICATIONS
3 HEAD DAYS

Table 4. Continued

VTY NO	VARIETY OR CROSS AND PEDIGREE	LOCATIONS 1	2	4	6	7	8	9	10	12	14	17	18	19	20
88	ND-SEL101(2) X PVN"S"/SIS"S" CM59710-2Y-1M-1Y-2M-3Y-0M	75	121	54	53	57	99	53	61	104	127	136	112	104	90
50	JUN"S" CM33483-C-7M-1Y-0M-5B-0Y	77	120	53	54	59	103	48	62	112	134	136	117	106	93
36	TAN"S" CM30697-2M-8Y-7M-1Y-1B-0Y	77	121	54	62	62	101	48	60	107	131	135	114	106	91
39	FCT"S" CM43598-1I-8Y-1M-5Y-2M-2Y-0B	78	122	53	56	58	112	48	61	110	134	137	115	107	93
75	PVN"S"-BJY"S" CM52326-1M-1Y-1Y-2M-0Y	72	130	56	54	54	101	48	60	110	135	135	116	105	95
98	MON"S" X BIS"S"-CAN"S" CM62142-5Y-3M-1Y-2M-4Y-0M	77	119	52	68	67	101	56	60	110	129	133	113	106	92
121	(RRV-MW15/BJ"S"-ON(2) X BON)NAC CM65202-3M-2Y-3M-3Y-0M	78	118	53	57	58	105	49	60	109	129	136	113	108	99
35	TAN"S" CM30697-2M-8Y-1M-1Y-1B-0Y	75	123	54	63	65	101	54	60	107	130	134	113	104	91
34	TAN"S" CM30697-2M-8Y-7M-0Y	75	124	54	61	63	101	51	61	107	130	134	114	103	90
101	NAC-VEE"S" CM64224-5Y-1M-1Y-0M	75	120	52	56	57	107	48	62	112	131	133	118	107	96
111	KEA"S"(KAL-BB X CJ"S"/ALD"S") CM64617-9M-1Y-1M-3Y-0M	76	117	54	56	59	101	49	59	110	130	136	118	105	85
64	LIRA"S" CM43903-H-4Y-1M-4Y-0M	79	129	55	64	63	106	56	60	110	136	138	117	108	80

VTY NO.	21	22	23	25	27	28	29	32	35	36	38	39	40	MEAN
88	142	133	122	52	135	100	66	96	61	61	78	75	63	90.0
50	149	124	122	46	133	97	64	96	56	63	79	75	63	90.4
36	148	123	122	56	133	99	67	98	62	62	78	75	63	90.9
39	155	133	122	52	---	108	66	94	56	67	83	75	69	90.9
75	146	129	122	53	135	100	61	98	56	63	78	75	68	90.9
98	142	122	121	63	128	90	68	95	65	63	78	75	63	91.0
121	147	128	122	56	133	93	65	97	58	63	79	75	68	91.0
35	148	123	122	57	128	99	67	96	64	62	79	75	68	91.2
34	148	123	124	55	128	98	67	96	62	62	90	75	68	91.3
101	154	123	120	48	136	100	63	98	60	63	82	75	68	91.3
111	156	131	125	55	135	97	65	97	61	67	80	75	69	91.4
64	154	129	122	59	---	110	69	96	62	63	80	75	68	91.8

Table 5. Top performing lines: maturity

LOCATIONS	CONTINENT	COUNTRY	AREA	VARIABLES INCLUDED
2	AFRICA	LIBYA	TRIPOLI-TAJOURA	4
3	AFRICA	MALAWI	NTCHEU DISTRICT (CENTRAL REG.)	4
4	AFRICA	NIGERIA	KANO	4
6	ASIA	BANGLADESH	JESSORE (IST. DATE)	4
7	ASIA	BANGLADESH	JESSORE (2nd. DATE)	4
9	ASIA	BURMA	YE-U (SAGAIN DIV.)	4
10	ASIA	CHINA	QINGHAI	4
12	ASIA	PAKISTAN	NWFP-PIRSABAK	4
15	ASIA	PHILIPPINES	LAGUNA	4
17	EUROPE	GREECE	THESSALONIKI	4
21	EUROPE	SPAIN	MADRID-ENCIN	4
23	MIDDLE EAST	IRAN	TEHRAN	4
25	MIDDLE EAST	QATAR		4
29	NORTH AMERICA	MEXICO	EL BATAN	4
39	SOUTH AMERICA	PERU	AYACUCHO	4
40	SOUTH AMERICA	PERU	CUSCO-TARAY	4

*VARIABLE IDENTIFICATIONS
4 MAT DAYS

Table 5. Continued

VTY NO	VARIETY OR CROSS AND PEDIGREE	LOCATIONS 2	3	4	6	7	9	10	12	15	17	21	23	25	29	39	40	MEAN
32	KEA"S" CM21335-C-9Y-3M-1Y-1Y-1Y-0B-2KE-0Y	---	110	84	98	97	106	139	156	78	178	197	165	98	126	112	136	125.3
75	PVN"S"-BJY"S" CM32326-1M-1Y-1Y-2M-0Y	152	110	82	98	97	105	136	153	78	178	194	165	100	129	112	136	126.6
111	KEA"S"(KAL-BB X CJ"S"/ALD"S") CM64617-9M-1Y-1M-3Y-0M	158	120	84	100	98	105	136	152	78	176	198	163	98	117	112	136	126.9
50	JUN"S" CM33483-C-7M-1Y-0M-5B-0Y	152	120	82	100	98	105	140	155	78	176	197	165	95	130	112	127	127.0
88	ND-SEL101(2) X PVN"S"/SIS"B" CM39710-2Y-1M-1Y-2M-3Y-0M	160	125	81	98	97	107	142	148	78	176	191	165	99	129	112	127	127.2
31	KEA"S" CM21335-C-9Y-3M-1Y-1Y-1Y-0B	160	110	84	98	97	105	139	155	78	179	196	165	98	126	112	136	127.4
94	MON"S"-IMU CM61942-4Y-2M-2Y-2M-2Y-0M	---	120	82	98	98	107	143	155	80	179	199	165	111	130	112	135	127.6
105	SPRW"S"-PVN"S" X VEE"S" CM64491-6Y-1M-5Y-0M	157	120	84	101	106	107	135	151	80	174	196	165	98	128	112	128	127.6
119	(RRV-W15/BJ"S"-ON(2) X BON)NAC CM63202-3M-2Y-1M-1Y-0M	157	120	81	98	99	105	135	152	80	176	193	165	110	128	112	136	127.9
85	VEE"S"/KLTO-PAT19 X MO-JUP CM38824-1Y-1M-1Y-0M	159	125	80	98	101	107	132	156	78	176	194	165	99	130	112	136	128.0
87	KEA"S"-TOW"S" CM38975-2Y-3M-1Y-7M-2Y-0M	158	120	84	98	98	107	140	152	78	176	197	165	99	130	112	136	128.1
33	KEA"S" CM21335-C-9Y-3M-1Y-1Y-1Y-0B-6KE-0Y	160	110	85	98	98	106	142	156	80	179	198	165	100	126	112	136	128.2
54	JUP-BJY"S" CM39992-12M-1Y-1M-1Y-1M-1Y-0B	159	120	81	98	98	106	138	156	78	178	197	165	102	130	112	134	128.3
73	BJY"S"-PRT CM30323-12Y-1M-1Y-0Y	160	110	84	102	103	110	132	153	80	174	192	165	106	133	112	137	128.3
112	PRL"S"-VEE"S" CM64624-2Y-1M-4Y-0M	157	120	82	100	100	110	133	154	87	174	198	165	101	126	112	136	128.4
36	TAN"S" CM30697-2M-8Y-7M-1Y-1B-0Y	159	120	82	103	100	107	141	149	87	178	196	165	103	127	112	127	128.5
34	TAN"S" CM30697-2M-8Y-7M-0Y	160	120	82	102	101	105	140	149	87	177	195	165	101	126	112	136	128.6
47	VEE"S" CM33027-F-15M-500Y-0M-89B-0Y	---	120	82	108	109	114	140	155	87	174	191	165	109	129	112	136	128.7
65	MAYA-MON"S" X KVZ-TRM CM44083-N-2Y-2M-1Y-1M-1Y-1M-0Y	161	125	82	100	99	107	141	156	78	177	198	165	106	131	112	125	128.9
103	TAN"S"/TI-TOB X ALD"S" CM64340-4M-1Y-1M-3Y-0M	160	120	82	100	104	113	138	151	80	176	197	165	101	130	112	134	128.9
110	R37-GHL121 X KAL-BB/KLT"S" CM64609-6Y-3M-2Y-0M	157	120	81	99	98	108	139	157	78	177	198	165	105	131	112	137	128.9
49	VEE"S" CM33027-F-15M-500Y-0M-115B-0Y	152	125	82	103	103	110	138	155	87	178	193	165	106	130	112	128	129.2
102	TAN"S"/TI-TOB X ALD"S" CM64340-4M-1Y-1M-2Y-0M	158	120	84	103	103	110	138	151	80	177	197	165	106	129	112	134	129.2
48	VEE"S" CM33027-F-15M-500Y-0M-98B-0Y	152	130	84	103	102	113	140	155	87	174	193	165	102	130	112	127	129.3
58	CMT-COC X PLO CM43473-J-1Y-1M-3Y-3M-0Y	---	130	84	102	103	113	140	156	87	176	195	165	112	129	112	136	129.3
59	FCT"S" CM43598-II-8Y-1M-5Y-2M-2Y-0B	161	125	81	98	98	105	140	154	78	177	198	167	108	130	112	136	129.3
109	R37-GHL121 X KAL-BB/KLT"S" CM64609-6Y-1M-2Y-0M	157	120	85	98	100	108	139	157	78	179	199	165	105	130	112	137	129.3

Table 5. Continued

VTY NO.	VARIETY OR CROSS AND PEDIGREE	LOCATIONS 2	3	4	6	7	9	10	12	15	17	21	23	25	29	39	40	MEAN
113	BNG"S"-PVN CM64653-8Y-3M-1Y-0M	157	120	84	99	103	110	135	154	87	176	195	164	108	128	112	136	129.3
101	NAC-VEE"S" CM64224-5Y-1M-1Y-0M	159	120	81	101	99	105	140	155	94	177	197	165	103	130	112	136	129.6
118	MORS-MON"S" CM64736-9Y-2M-1Y-0M	157	120	82	100	104	110	133	152	87	179	196	165	110	130	112	137	129.6
51	JUN"S" CM33483-C-7M-1Y-0M-11B-0Y	159	120	81	102	99	118	143	156	80	175	198	165	101	130	112	136	129.7
92	MAYA-NAC CM39424-1Y-1M-4Y-1M-2Y-1M-0Y	152	120	90	104	103	118	138	154	78	176	197	165	103	131	112	134	129.7
108	R37-ONL121 X KAL-BB/KLT"S" CM64609-6Y-3M-1Y-0M	157	120	84	98	99	108	140	157	78	179	198	167	106	131	112	141	129.7
120	LOCAL CHECK	157	120	80	96	94	110	142	156	87	176	200	165	120	---	105	137	129.7
104	SPRW"S"-PVN"S" X VEE"S" CM64491-6Y-1M-1Y-0M	158	120	83	101	106	120	135	151	94	174	195	165	102	128	112	132	129.8
126	KEA"S"-BUC"S" CM67354-14Y-2M-3Y-0M	158	120	84	100	101	105	140	159	80	179	195	165	106	130	118	136	129.8
44	VEE"S" CM33027-F-15M-500Y-0M-66B-0Y	159	125	83	105	102	119	138	154	87	174	191	165	109	129	112	127	129.9
114	BNG"S"-PVN CM64653-8Y-3M-2Y-0M	157	120	85	100	106	120	137	153	87	174	191	165	111	126	112	136	130.0

Table 6. Top performing lines: Stem rust

LOCATIONS	CONTINENT	COUNTRY	AREA	VARIABLES INCLUDED
28	MIDDLE EAST	TURKEY	IZMIR-AEGEAN	8
35	SOUTH AMERICA	BOLIVIA	SANTA CRUZ-CIAT	8
36	SOUTH AMERICA	BRAZIL	PARANA-LONDRINA	8
40	SOUTH AMERICA	PERU	CUSCO-TARAY	8

*VARIABLE IDENTIFICATIONS
8 STEM RUST

VTY NO.	VARIETY OR CROSS AND PEDIGREE	LOCATIONS 28	35	36	40	MEAN
114	BNQ"S"-PVN CM64653-8Y-3M-2Y-0M	-----	0	TMR	5MR	0.7
31	KEA"S" CM21335-C-9Y-3M-1Y-1Y-1Y-0B	-----	TMR	5MR	5MR	1.3
62	LIRA"S" CM43903-H-4Y-1M-1Y-3M-2Y-0B	-----	0	5MS	TR	1.3
104	SPRW"S"-PVN"S" X VEE"S" CM64491-6Y-1M-1Y-0M	-----	0	5MR	5MR	1.3
112	PRL"S"-VEE"S" CM64624-2Y-1M-4Y-0M	-----	TMR	TMR	10MR	1.3
113	BNQ"S"-PVN CM64653-8Y-3M-1Y-0M	-----	0	5MR	5MR	1.3
123	(4777(2) X FKN-9B/VEE"S")BUC"S"-PVN" " CM66684-B-1M-6Y-3M-3Y-0M	5MS	0	5MR	TR	1.5
39	VEE69 CM33027-F-12M-1Y-12M-1Y-2M-0Y	-----	0	10MR	5MR	2.0
58	CMT-COC X PLO CM43473-J-1Y-1M-3Y-3M-0Y	-----	-----	TR	10MR	2.0
61	LIRA"S" CM43903-H-2Y-1M-5Y-1M-1Y-1M-0Y	-----	TMR	5MS	5MR	2.0
63	LIRA"S" CM43903-H-4Y-1M-1Y-3M-3Y-0B	-----	0	5MS	5MR	2.0
103	TAN"S"/TI-TOB X ALD"S" CM64340-4M-1Y-1M-3Y-0M	-----	0	10MR	5MR	2.0
105	SPRW"S"-PVN"S" X VEE"S" CM64491-6Y-1M-5Y-0M	-----	0	10MR	5MR	2.0
106	MYNA"S"-VUL"S" CM64546-2M-1Y-1M-5Y-0M	-----	TR	10MR	5MR	2.0
116	BNQ"S"-PVN CM64653-8Y-4M-1Y-0M	-----	TR	5MS	5MR	2.0

Table 7. Top performing lines: leaf rust

LOCATIONS	CONTINENT	COUNTRY	AREA	VARIABLES INCLUDED
6	ASIA	BANGLADESH	JESSORE (1ST. DATE)	7
7	ASIA	BANGLADESH	JESSORE (2nd. DATE)	7
10	ASIA	CHINA	QINGHAI	7
11	ASIA	NEPAL	LALITPUR	7
24	MIDDLE EAST	ISRAEL	BET DAGAN-VOLCANI CTR.	7
26	MIDDLE EAST	TURKEY	ADANA-CUKUROVA	7
28	MIDDLE EAST	TURKEY	IZMIR-AEGEAN	7
29	NORTH AMERICA	MEXICO	EL BATAN	7
32	SOUTH AMERICA	ARGENTINA	BUENOS AIRES-CRIADERO BUCK	7
35	SOUTH AMERICA	BOLIVIA	SANTA CRUZ-CIAT	7
36	SOUTH AMERICA	BRAZIL	PARANA-LONDRINA	7

#VARIABLE IDENTIFICATIONS
7 LEAF RUST

Table 7. Continued

VTY NO.	VARIETY OR CROSS AND PEDIGREE	LOCATIONS 6	7	10	11	24	26	28	29	32	35	36	MEAN
71	PAT10-ALD"S" X PAT72300/PVN"S" CM49922-1M-2Y-1Y-1M-1Y-0M	0	0	TR	-----	TR	-----	-----	TR	-----	TR	TMS	0.1
59	FCT"S" CM43598-II-8Y-1M-5Y-2M-2Y-0B	0	0	TR	-----	-----	-----	-----	TR	-----	TR	5MR	0.3
72	PAT10-ALD"S" X PAT72300/PVN"S" CM49922-1M-2Y-1Y-1M-3Y-0M	0	0	5R	-----	TR	-----	-----	TR	-----	TR	TMS	0.3
86	DOVE"S"-TSI CM58952-3Y-1M-1Y-2M-0Y	0	0	TR	-----	-----	-----	-----	5MR	-----	TR	0	0.3
4	AMD"S"-HN4 X COC BMM6838-35Y-1Y-1Y-2Y-0Y	0	0	TR	-----	-----	-----	-----	5MR	-----	TR	TMS	0.5
39	VEE89 CM33027-F-12M-1Y-12M-1Y-2M-0Y	0	0	TR	-----	-----	-----	-----	10MR	-----	TR	TS	0.8
97	MON"S" X SIB"S"-CAN"S" CM62142-5Y-3M-1Y-2M-1Y-0M	0	0	10MR	-----	-----	-----	-----	TR	-----	TR	TS	0.8
122	JCAM-EMU"S" X CHRC"S"(IA820 X WTE(3) -NAR/KVK"S") CM66246-C-1M-1Y-1M-2Y-0M	0	0	10MR	-----	-----	-----	-----	0	-----	TR	TS	0.8
37	VEE88 CM33027-F-12M-1Y-1M-1Y-1M-0Y	0	0	TR	-----	-----	-----	-----	5M	-----	10MR-R	TMR	1.0
55	JUP-BJY"S" CM40038-6M-4Y-2M-1Y-2M-1Y-0B	0	0	15MR	-----	TR	-----	-----	5MR	-----	TR	TMS	1.3
102	TAN"S"/TI-TDB X ALD"S" CM64340-4M-1Y-1M-2Y-0M	0	0	10MS	-----	-----	-----	-----	5R	-----	TR	TR	1.5
17	KLIM X D6301-NAI60/KAL-BB BMM7134-2Y-1Y-1Y-0Y	0	0	5R	5MS	-----	-----	-----	TR	-----	20MR-R	TR	1.6
53	HD2206-HORK"S" CM39808-58M-2Y-4M-1Y-1M-1Y-0B	0	0	TR	-----	5MS	-----	-----	5MR	-----	TMS	5MS	1.6
110	R37-GHL121 X KAL-BB/KLT"S" CM64609-6Y-3M-2Y-0M	0	0	10S	-----	-----	-----	-----	TR	-----	TR	TR	1.7
112	PRL"S"-VEE"S" CM64624-2Y-1M-4Y-0M	0	0	10MR	-----	-----	-----	-----	15MR	-----	TR	TR	1.7
41	VEE"S" CM33027-F-12M-1Y-1M-1Y-1M-0Y- 608-0Y-1PTZ-0Y	0	0	TR	-----	-----	-----	-----	15M	-----	TR	5MR	1.8

Table 8. Top performing lines: stripe rust

LOCATIONS	CONTINENT	COUNTRY	AREA	VARIABLES INCLUDED
1	AFRICA	KENYA	RIFT VALLEY-NGORE	5
10	ASIA	CHINA	QINGHAI	5
24	MIDDLE EAST	ISRAEL	BET DAGAN-VOLCANI CTR.	5
28	MIDDLE EAST	TURKEY	IZMIR-AEGEAN	5
32	SOUTH AMERICA	ARGENTINA	BUENOS AIRES-CRIADERO BUCK	5
38	SOUTH AMERICA	ECUADOR	QUITO, PICHINCHA	5
40	SOUTH AMERICA	PERU	CUSCO-TARAY	5

#VARIABLE IDENTIFICATIONS
5 STRP RT.L

VTY NO.	VARIETY OR CROSS AND PEDIGREE	LOCATIONS 1	10	24	28	32	38	40	MEAN
48	VEE"S" CM33027-F-15M-500Y-0M-98B-0Y	TR	TR	-----	-----	-----	TMR	0	0.0
86	DOVE"S"-TSI CM58952-3Y-1M-1Y-2M-0Y	0	TR	-----	-----	0	TR	0	0.0
112	PRL"S"-VEE"S" CM64624-2Y-1M-4Y-0M	0	TR	-----	-----	-----	TR	0	0.0
44	VEE"S" CM33027-F-15M-500Y-0M-66B-0Y	TMS	TR	-----	-----	-----	0	0	0.3
46	VEE"S" CM33027-F-15M-500Y-0M-76B-0Y	TMS	TR	-----	-----	-----	0	0	0.3
87	KEA"S"-TOW"S" CM58975-2Y-3M-1Y-7M-2Y-0M	0	TR	-----	-----	10MR	0	0	0.8
106	MYNA"S"-VUL"S" CM64546-2M-1Y-1M-5Y-0M	0	5MS	-----	-----	-----	TR	0	1.0
45	VEE"S" CM33027-F-15M-500Y-0M-75B-0Y	5S	TR	-----	-----	-----	TR	0	1.3
73	BJY"S"-PRT CM50323-12Y-1M-1Y-0Y	5MS	TR	-----	-----	10MR	TR	0	1.6
61	LIRA"S" CM43903-M-2Y-1M-5Y-1M-1Y-1M-0Y	0	20MR	-----	-----	-----	0	0	2.0

CENTRO INTERNACIONAL DE MEJORAMIENTO DE MAIZ Y TRIGO
INTERNATIONAL MAIZE AND WHEAT IMPROVEMENT CENTER
Lisboa 27 Apartado Postal 6-641 06600 México, D.F. México